

REMARKS

Claims 1, 2 and 4-12 are currently pending for examination. Claims 1-5 were previously rejected. Claims 1 and 5 were amended, claims 6-12 are added and claim 3 was canceled. Applicants submit that no new matter is added by this amendment. Favorable reconsideration and allowance of this application is respectfully requested in light of the foregoing remarks.

Drawings

Corrected drawings are submitted herewith in response to the examiners objection. In replacement Figures 2, one of the reference characters "9" has been removed. Replacement Figure 2 has also been altered to show the thickness of the guide bushing 24' completely surrounding the bearing tube. Applicants respectfully request the removal of this objection.

Claim Objections

Claim 1 was objected to by the office action for informalities based on a broad limitation followed by a narrow limitation. Applicants have amended the preamble of claim 1 to eliminate having a broad limitation followed by a narrow limitation, removal of this objection is therefore requested.

Rejection of Claims 1-5 under 35 U.S.C. §112

Claims 1-5 were rejected under 35 U.S.C. §112, second paragraph, as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 has been amended to more particularly claim the subject matter and clarify that the components discussed in the preamble are the same as discussed in the body of the claim. The reference to "components acting on the bearing" has been clarified as to acting on the pin. The recitation "by the bearing" with respect to the second component has been removed.

Claim 3 has been canceled making the rejection moot.

Accordingly, removal of these rejections is respectfully requested. Claims 2 and 4-5 depend from Claim 1, and the rejection against them should also be removed.

Rejection of Claims under 35 U.S.C. §102

Claims 1, 3 and 5 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 4,096,957 to Iverson.

Iverson discloses a pivot pin assembly for mounting a loader bucket on a loader arm. A cylindrical pin inside of sleeve bearing is inserted into spaced apart retaining sleeves. A flanges mounted to a bracket that is connected to one of the retaining sleeves prevent axial movement of the pin in one direction, while a cover plate secured to the bracket prevents axial movement of the pin in another direction.

Claim 1 recites a bearing at a joint between first and second articulated components on a construction machine and a third component. The bearing is formed by the intersection of the components and a pin located in a bearing sleeve that interconnects the components. The third component is attached to at least one end of the pin which protrudes from the sleeve. Iverson fails to disclose a third component that transmits an applied force to the pin and can rotate with respect to the pin and the first and second components. The third component of Iverson as indicated by the examiner is a reinforcement ring which is welded to the side of the bracket, which is the second component. The third component of Iverson is therefore unable to rotate with respect to the first and second component as well as the pin and further can not transmit an applied force to the pin.

Iverson does not describe or suggest the recited elements of claim 1. Accordingly, allowance of claim 1 is respectfully requested. Claims 5 depends from claim 1 and as such should be allowed for at least the same reasons of allowability of claim 1 as presented above.

Claim 1 and 2 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,069,509 to Johnson et al.

Johnson discloses an endless track chain with a rotatable sealed sleeve mounted about the bushing. Johnson uses a track hinge joint for articulately

coupling a pair of outboard link ends on a first chain to an inboard set of links on a second chain. The pin is non-rotatably secured to the out-board link ends, a bushing is received about the pin and non-rotatably secured to the in-board link. A cylindrical sleeve is mounted about the bushing.

Claim 1 as discussed above is directed to a bearing for articulating three components about a fixed pin and sleeve wherein all three components are rotatable about the axis through the pin with respect to the pin. The third component of Johnson is non-rotatably secured to the link portions of the pin and can not be rotated with respect to both the pin as well as the first and second component.

Nowhere does Johnson describe or suggest the recited elements of Claim 1. Accordingly, allowance of claim 1 is respectfully requested. Claim 2 depends directly from claim 1 and as such should be allowed for at least the same reasons of allowability of claim 1 as presented above.

Rejections under 35 U.S.C. §103

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Johnson in view of German reference DE-926,532 to Traktoren.

Claim 4 depends directly from claim 1 and as such should be allowed for at least the same reasons of allowability of claim 1 as presented above.

Applicants respectfully request withdrawal of this rejection.

New Claims 6-12

Claims 6 -12 have been added claiming a construction machine utilizing the previously claimed part. Claim 6 recites construction machine having a bearing between a first, second boom component and a third component. The third component transmits an applied force to the pin and can rotate with respect to the pin and the first and second components. Neither Johnson nor Iverson relate to a bearing between the articulated booms of a construction machine or disclose a third component that transmits an applied force to the pin and can rotate with respect to the pin and the first and second components.

Claims 7-12 are dependent on claim 6 and should be allowable for at least the same reasons as claim 6. Claims 7-12 however are separately patentable for the reasons listed below.

Claims 7 is directed to the arrangement of bearing points for the components of a boom, none of the references cited disclose a bearing for a boom having three components in contact with the pin where the first boom component is located in contact with the middle of the bearing tube; a second set of bearing points of the second boom component located immediately outside of adjacent to the bearing points of the first boom component. The bearing points of both the first and second articulated boom component can slide on the external diameter of the bearing tube. Claim 8 recites using guide bushings on the first and second components in association with the configuration. None of the cited prior art is directed towards having three movable components located along a pin using this particular configuration or the use of guide bushings for the bearing along an articulation joint between the booms of a construction machine.

Claim 9 recites that the second boom component is inserted over the first boom component. This improved design as discussed in provides a stronger and cheaper to produce boom connection. The cited prior art references are not related to a bearing between two boom components and do not disclose a second boom component inserted over a first boom component of a construction vehicle, wherein the boom components form part of the bearing.

Claim 10 recites that the third component is an adjustment cylinder. None of the prior art references disclose an adjustment cylinder located along the pin outside of the two articulated boom members for acting on the pin and swiveling the back boom of the assembly. By attaching the cylinder to the end of the pin, the bending moments acting on the pin are low and the pin can consequently have a small external diameter.

Claim 11 recites that the external diameter of a mid-section of the pin is less than an external diameter at either end of the pin. The pin can have a relatively small external diameter because it does not bear hardly any of the forces from the first and second components. The forces from the third component, which the pin has to accept, are only transmitted to the ends of the pin protruding from the bearing

tube, so that the bending moments acting on the pin are low and so that the pin can having a small external diameter. None of the prior art references disclose a similarly shaped pin to achieve the same force distribution between the pin and bearing tube.

Claim 12 recites that a ring having a locking connector is inserted over both ends of the pin and maintains the axial alignment of the components located there between. The locking connector can be easily removed and allow the three components along the bearings more freedom of motion while maintaining axial alignment. The prior art references do not disclose such a configuration for securing the pin and instead generally relies on the third component as a locking member. In Johnson the pin is deformably forced into the cooperating groove making it difficult to remove while in Iverson the pin is retained by both flanges and a bolt on cover plate.

Applicants respectfully submit that newly added claims 6-12 define patentable subject matter and allowance of claims 6-12 is respectfully requested.

Conclusion

Applicants respectfully submit that claims 1, 2 and 4-12 define patentable subject matter. A Notice of Allowance is therefore respectfully requested.

No fee is believed due with this communication. Nevertheless, should the Examiner consider any fees to be payable in conjunction with this or any future communication, authorization is given to direct payment of such fees, or credit any overpayment to Deposit Account No. 14-0780. The Examiner is invited to contact the undersigned by telephone if it would help expedite matters.

Respectfully submitted,

/Patrick M. Sheldrake/
Patrick M. Sheldrake
Attorney for Applicant(s)
Reg. No. 60,411
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(717) 355-4954 Phone
(717) 355-3107 Fax